Space Weather Forecast

Issued on Wednesday 16 October 2024 at 01:18 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight Chance G1 Minor Geomagnetic Storm early day 1 (16 Oct), and perhaps from later day 3 (18 Oct). Ongoing Chance of further Moderate flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with several Moderate-class flares observed through the period, with the peak flare originating from the largest region, located in the southwest quadrant.

There are currently eight numbered sunspot regions on the Earth facing disc, with a new small un-numbered region having also emerged in the southeast quadrant. The two largest regions are located in the southwest quadrant and form a coupled pair of prominent bipolar sunspots, being responsible for the majority of flare activity. Both spot groups have shown small changes in evolution, however the larger and northernmost group has seen further small lead/intermediate spot emergence. Other numbered spot groups are small and magnetically simple.

No Earth-directed coronal mass ejections (CMEs) have been observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were largely at slightly elevated levels, with a slight decreasing tendency. The Interplanetary Magnetic Field (IMF) was predominantly weak, with the important north-south component weakly variable. Geomagnetic activity was Quiet to Unsettled (Kp 2-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) were at background, with no Solar Radiation Storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Further Moderate-class activity is expected with a slight chance of isolated Strong-class flares.

Solar Wind / Geomagnetic Activity: Ongoing slightly elevated solar winds and residual weak CME influence are expected to gradually ease during the first half of day 1 (16 Oct). There is then the potential for elevated winds to develop from later on day 3 (18 Oct) into day 4 (19 Oct), due to faster winds in association with a large coronal hole in the northern hemisphere.

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Overall, geomagnetic activity is expected to be mainly Quiet to Unsettled. There is a likelihood of Active intervals both to start and end the forecast associated with possible glancing CME effects or coronal hole influence, and there is a slight chance of isolated G1 Minor Storm intervals day 1 (16 Oct) and days 3 and 4 (18 and 19 Oct).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to remain at background, with no Solar Radiation Storms occurring. However, there remains a slight chance of further enhancements given any significant flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	1	10	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	40	35	35	35
Very Active	R3-R5 (X Class)	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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